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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,354

01/31/2007

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SPAN3008/FJD

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EXAMINER

DEVITO, ALEX T

ART UNIT

PAPER NUMBER

4176

MAIL DATE

DELIVERY MODE

11/20/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,354	Applicant(s) SPANKE ET AL.	
	Examiner ALEX DEVITO	Art Unit 4176	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/19/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the Applicant's communication filed on June 19, 2006 and the preliminary amendment concurrently filed therewith. In virtue of this preliminary amendment, original claims 1-10 are canceled; claims 11-20 are newly added; and thus, claims 11-20 are currently presented in the instant application.

Information Disclosure Statement

1. The Information Disclosure Statement filed on 6/19/06 is in compliance with 37 C.F.R. 1.97. Accordingly, the Information Disclosure Statement is being considered by the examiner.

Drawings

2. The drawings submitted on 1/31/2007 are accepted.

Claim Objections/Minor Informalities

3. Claims 14 and 20 are objected to because of the following informalities:
Claim 14, line 2, --with the assumption-- should be inserted between "made" and "that";
line 2, --the-- should be inserted between "for" and "maxima";
line 2, "equal" should be replaced with "equals the";
Claim 20, line 3, "continuously" should be replaced with "continually".

Appropriate correction is required.

4. Claim 19 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 19 discloses an

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estimated value for the travel-time of the current wanted echo is calculated while claim 18 discloses a predicted travel-time to be expected for the echo in the case of a current measurement is ascertained on the basis of at least one preceding measurement. Both claims predict a value based on prior data by the same selection criteria of minimizing the deviation between echo functions and predicted values for determining the current fill level.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11-15, 17 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Kroemer et al. (U.S. Patent No. 5,587,969), hereinafter Kroemer.

With respect to claim 11, Kroemer discloses a method for measuring a fill level of a fill substance in a container using a fill level measuring device operating according to a travel-time principle, comprising the steps of: sending periodic transmission signals toward the fill substance (column 4, lines 7-9); registering and converting their echo signals into an echo function (column 5, lines 28-29 and see Figure 3 for the echo profile as a function); and determining at least one echo characteristic of the echo function (column 5, lines 33-34), and, on the basis of echo characteristics of at least one preceding measurement, a prediction is derived for echo characteristics to be expected

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in the case of a current measurement (column 5, lines 40-44), wherein: echo characteristics of the current measurement are determined, taking into consideration the prediction, and, on the basis of the echo characteristics, the current fill level is determined (column 5, lines 17-44).

With respect to claim 12, Kroemer discloses a method as claimed in claim 11, wherein: the echo characteristics include travel-times of maxima of the echo function (column 5, lines 33-34) and a known reflector in the interior of the container (column 4, lines 61-63), especially a fill substance surface, a floor of the container or a fixedly installed disturbance, can be associated with the maxima.

With respect to claim 13, Kroemer discloses a method as claimed in claim 12, wherein: on the basis of travel-time of at least one maximum of a previous measurement, a prediction is made for travel-time of a corresponding maximum to be expected in the case of the current measurement (column 5, lines 33-44 and 40-44).

With respect to claim 14, Kroemer discloses a method as claimed in claim 13, wherein: a prediction is made with the assumption that travel-times to be expected for the maxima equals the travel-times of corresponding maxima of a preceding measurement (column 5, 40-44).

With respect to claim 15, Kroemer discloses a method as claimed in claim 13, wherein: the prediction is made for travel-times of the maxima by calculating an instantaneous rate of change of the travel-times on the basis of at least two preceding measurements (column 8, lines 25-30) and the travel-time to be expected is extrapolated on the basis of this rate of change (column 8, lines 31-33).

With respect to claim 17, Kroemer discloses a method as claimed in claim 11, wherein: an echo characteristic is a travel-time of a wanted echo (column 5, lines 33-34) reflected on the fill substance surface (column 4, lines 7-9); a predicted travel-time to be expected for the wanted echo reflected on the fill substance surface in the case of a current measurement is ascertained on the basis of at least one preceding measurement (column 5, lines 17-27); that maximum of an echo function for the current measurement is selected whose travel-time has a smallest deviation from the predicted travel-time of the wanted echo reflected on the fill substance surface (columns 7 and 8, lines 67, 1-2); and, taking into consideration the travel-time of this maximum, the current fill level is ascertained (column 7, lines 63-65). Note that choosing the measurement with the lowest probability of being a multiple echo is the same as selecting the measurement with the smallest deviation from the predicted travel time (column 4, lines 24-28).

With respect to claim 20, Kroemer discloses a method as claimed in claim 11, wherein: the measured results are continually (column 7, lines 26-30).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kroemer et al. (U.S. Patent No. 5,587,969) in view of Wikipedia-Polynomial interpolation (http://en.wikipedia.org/wiki/Polynomial_interpolation).

With respect to claim 16, Kroemer discloses all the claimed limitations of claim 13, as expressly recited above, and also discloses that the prediction is made for travel-times of the maxima by calculating an instantaneous rate of change of the travel-times on the basis of at least three preceding measurements (column 8, lines 25-30) and the travel-time to be expected is extrapolated on the basis of this rate of change (column 8, lines 31-33). Kroemer however remains silent with regards to the prediction made for travel-times of the maxima by calculating an instantaneous acceleration and the travel-time to be expected is extrapolated on the basis of the acceleration.

Wikipedia-Polynomial interpolation discloses a method wherein the prediction made for travel-times of the maxima by calculating an instantaneous acceleration and

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the travel-time to be expected is extrapolated on the basis of the acceleration (page 2, line 1-11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Kroemer by implementing the method wherein the prediction made for travel-times of the maxima by calculating an instantaneous acceleration and the travel-time to be expected is extrapolated on the basis of the acceleration as taught by Wikipedia-Polynomial interpolation for a benefit of reducing error (page 2, line 9).

10. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroemer et al. (U.S. Patent No. 5,587,969) in view of Fehrenkamp (U.S. Application No. 2003/0011480), hereinafter Fehrenkamp.

With respect to claims 18 and 19, Kroemer discloses all the claimed limitations of claim 11, as expressly recited above, and also discloses an echo characteristic is a travel-time of an echo (column 5, lines 33-34); a predicted travel-time to be expected for the echo in the case of a current measurement is ascertained on the basis of at least one preceding measurement (column 5, lines 40-44); that maximum of an echo function for the current measurement is selected whose travel-time has a smallest deviation from the predicted travel-time of the echo (columns 7 and 8, lines 67, 1-2); and, taking into consideration the travel-time of this maximum, the current fill level is ascertained (column 7, line 63). Kroemer, however, does not explicitly define that an echo characteristic be a travel-time of an echo reflected on the floor of the container.

Fehrenkamp discloses a method for measuring a fill level of a fill substance in a container using a fill level measuring device operating according to a travel-time principle wherein an echo characteristic is a travel-time of an echo reflected on the floor of the container in order to house the fill level measuring device at the top of the container (paragraph 35, lines 1-8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method for measuring a fill level of a fill substance in a container of Kroemer by using the travel-time of an echo reflected on the floor of the container as an echo characteristic as taught by Fehrenkamp for the benefit of housing the fill level measuring device at the top of the container (paragraph 35, lines 1-8).

Citation of relevant prior art

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Willis et al. (US Patent No. 2,330,829) discloses an apparatus for measuring the level of contents in a container via an ultrasonic transmitter;

Olson et al. (US Patent No. 4,901,245) discloses a nonintrusive acoustic liquid level sensor; and

Shakkottai et al. (US Patent No. 5,062,295) discloses a dual tube sonic level gage.

Inquiry

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX DEVITO whose telephone number is (571)270-7551. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm
Alternate Friday's off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thuy Vinh Tran can be reached on 571-272-1828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ALEX DEVITO/
Examiner, Art Unit 4176
11/17/08

/Thuy Vinh Tran/
Supervisory Patent Examiner, Art Unit 4176

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